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Friendly Opposition: The Red Team's Role in Strengthening Operational Design

by

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Preface

Early in my aviation career I came to appreciate the value of careful mission planning and attention to the old adage that the best laid plans of men and mice often go astray. Effectiveness at the tactical level often rests on a personal willingness to accept the constructive criticism afforded by one's colleagues. Effective organizations are typically characterized by a collective willingness to provide friendly opposition and critical 'what-if' analysis among peers as well as up or down a chain of command. Questions about whether this type of critical, but constructive, analysis was formal part of operational design or the planning process in general led to my research on how red teaming is applied to war planning. Much of what has been written on this subject focuses on red teams' value across a wide spectrum of application, from tactical threat emulation to Devil's advocacy in evaluating emerging strategic concepts. Little has been written about how to effectively integrate red teaming into strategic and operational level planning. This paper focuses on improved decision analysis through integrating the alternative perspective afforded by red teaming throughout the planning process.

I'd like to express my gratitude to Dr. Jeffery Reilly. His patience, expertise, and dedication to his students, provides a rising generation of military leaders with an intellectual foundation for success. I'd also like to thank Dr. Greg Fontenot, director of the University of Foreign Military Cultural Studies, and the U.S. Africa Command planning team for their enthusiastic support. Most importantly, I thank my wife, Katie, for her immeasurably selfless support.

Abstract

This research paper suggests a framework for improved decision analysis through the alternative perspective and critical analysis provided by commanders' red teams. It defines red team activity as it relates to the Joint Operations Planning Process (JOPP), discusses shortfalls in existing red team usage, and establishes a framework for integrating red team analysis throughout the planning process to improve decision analysis. It uses the 1945 British counteroffensive, led by Field Marshall William Slim, to illustrate how red team analysis at both the theater-strategic and operational levels of war support decision analysis.

Serving as a semi-independent, but fully integrated, part of commander' planning staffs, the red team provides a measure of apperception, enabling critical analysis of operational plans unconstrained by a single cultural point of view or operational perspective. Through independent problem framing and strategy development from an adversary's perspective, the red team can improve decision analysis to help commanders mitigate risk and better exploit emergent opportunities. While red team usage above the tactical level of war has been hindered by a variety of factors, the value of enabling alternative analysis by recognizing red teaming as a formal discipline promises to advance its effectiveness. The alignment of the JOPP with operational design, decision analysis and the friendly opposition afforded by robust red teaming, work in concert to advance a commander's ability to capably lead operational planning in an increasingly complex security environment.

Chapter 1: Introduction

Successful operations planning in an increasingly complex security environment requires decision analysis buttressed by effective red teaming. Effectively assessing both friendly and enemy decisions demands advances in how red teams are employed throughout the operational planning process. The red team's function cannot be limited to that of a surrogate enemy during wargaming. Instead, the friendly opposition and critical analysis red teams provide must be integrated into the planning process from initiation through mission execution. This integration requires assessing and challenging our perception of circumstances and expectation of results at both theater-strategic and operational levels, as well as its function, constitution, and interaction with 'blue' during each phase of planning. Effective red teaming promises to help commanders validate assumptions, mitigate risk, and exploit emergent opportunities. Every red team action should focus on a single end: to help build a plan that not only survives first contact with the enemy, but provides a path to achieve national objectives in the long run. Building that path requires planning supported by red team effort aimed at improved decision analysis within the framework of commander driven operational design.

On the 3rd December 1944, elements of the British 14th Army crossed the Chindwin River in northern Burma launching Field Marshal William Slim's 1945 counteroffensive against Japan's Burma Area Army. In the six months that followed, the 14th advanced nearly 500 miles south to Rangoon, executed the "longest opposed river crossing attempted in any theatre of the Second World War,"¹ and defeated Lieutenant General Hyotaro Kimura's forces in detail. Slim's victory stands as an example of how incorporating "alternative perspectives"² can mitigate operational risk and allow the flexibility necessary to exploit emergent opportunities.

Slim's operational assumptions rested on the Japanese conforming to type: bold, inflexible, reluctant to adapt a plan, and loathe to concede territory without a struggle. Under that assumption, and despite obvious disadvantages to the Japanese, Slim hoped to bait them into a decisive battle on the Shwebo plain, north of their defensive redoubts along the Irrawaddy River, and on terrain that favored British armor. Japan's high command had ordered Kimura to hold *southern* Burma as Japan's northern flank in South East Asia. *Central* Burma was to be held, 'dekiru kagiri'—'as far as possible'. Kimura planned to withdraw from the Shwebo plain, identify Slim's main thrust for Mandalay, the city considered vital to holding central Burma, and halt the British at his decisive 'Battle of Irrawaddy Shore.'

A week after his forces crossed the Chindwin, Slim realized that the Japanese would not meet him on the Shwebo plain. "The first thing to do was to discover, or at least re-estimate, what was now the Japanese intention."³ His branch plan called for sending his 33 Corps and 19th Division across the Irrawaddy near Mandalay to entice Kimura into committing forces where he expected a fight. Meanwhile, under cover of radio silence and military deception, Slim would route his 4 Corp south through the Gangaw Valley to cross the Irrawaddy near Pakokku then advance, without pause, on Meiktila. Situated 75 miles south of Mandalay, Meiktila served as a control and logistics hub for Japanese forces stretching along a 125 mile arc of the Irrawaddy from Mandalay to Chauk. Despite Mandalay's symbolic importance, control of Kimura's forces in central Burma rested on control of Meiktila. Though risky, Slim's capture of Meiktila exploited a critical Japanese vulnerability.

Like Slim's original plan, his branch plan's success rested on assumptions. First, that the Japanese would not cede Mandalay as they had ceded the Shwebo plain. Second, that "instead of building up a strong, well-prepared" counterattack, the Japanese would commit forces to battle

piecemeal as they arrived.⁴ From experience, Slim knew that taking the initiative from the Japanese typically left them “confused and easy to kill.”⁵ These assumptions held true. Despite his orders to hold central Burma ‘dekiru kagiri,’ Kimura held true to the ‘Japanese form’ Slim hoped to exploit, and directed his 15th Army to “defend Mandalay to the death.”⁶ After the war, Kimura remarked, “Strategically, I never considered Mandalay worth any serious defense. The only reason it was held at all was for its prestige value.”⁷ When Kimura’s generals realized that Meiktila as the decisive objective they too reacted as expected. “The enemy’s total forces directed to the Meiktila battle, formidable as they were in numbers, were arriving piecemeal, drawn from many formations, and from all directions.”⁸

On 3 May 1944, British forces liberated Rangoon thus closing a counteroffensive against an adversary known for its often suicidal tenacity in defense. This operation’s success rested on analysis of a complex adversary. Despite noting “how very ignorant [he] was of the Japanese, their methods and their commanders,”⁹ when he arrived in Burma, Slim leveraged his study of the Russo-Japanese war, discussions with Chinese who had successfully beaten the Japanese at Changsha, and his personal experience between 1942 and 1944 to analyze and exploit his adversary. Success today requires similar analysis, but today’s commanders face a far more complex environment and more compressed decision cycle than any commander did 65 years ago. The 2010 Quadrennial Defense Review Report opens with a four page description of an increasingly complex security environment characterized by rising powers, influential non-state actors, and the diffusion of technologically advanced and destructive weaponry.¹⁰ It is unlikely that Slim’s planning staff included a formalized red team dedicated to bolstering his decision analysis. However, today’s environment demands a formalized source of independent analysis that exists to support commander’s decision analysis throughout mission planning and execution.

Chapter 2: Defining the Red Team's Role and Focus

Before discussing how red teams support the planning process, and more specifically decision analysis, it is necessary to define red team activity within the context of operations planning. Red team activity can range from emulating enemy fighter tactics over the Nevada desert to probing security vulnerabilities within a facility or organization. The Defense Science Board (DSB) lists three categories of red team activity: surrogate adversaries and competitors, Devil's advocates, and "general advisory boards" for independent judgment.¹¹ The first category is most closely aligned with threat emulation—an area in which the DOD has enjoyed long standing tactical level success. Each of the services maintains world class capability in this category: the Air Force's Aggressor squadrons, the Navy's Subsurface Ballistic Nuclear (SSBN) Security Program, and the Army's training facilities at Fort Irwin are all excellent examples of how threat emulation is used to hone tactical readiness. Devil's advocate red teaming exists to challenge an organizations strategies, plans, and assumptions. The Devil's advocate still functions as a surrogate enemy, but its focus shifts toward less tangible aspects of warfighting; bridging the gap between adversaries' actions and how adversaries decide to act. The third category suggests the red team's role as a home for considering and applying alternative points of view. In directing the development of structured Army red teams, former Chief of Staff of the Army, General Peter Schoomaker, called for teams that "could escape the gravitational pull of western military theory."¹²

The description of red teaming offered by a recent version of the U.S. Army Red Teaming Handbook is both comprehensive and informative. It defines red teaming as "a function executed by trained, educated, and practiced team members that provides commanders an independent capability to fully explore alternatives in plans, operations, concepts,

organizations, and capabilities in the context of the operational environment and from the perspectives of our partners, adversaries, and others.”¹³ Joint Planning 2-0, *Joint Intelligence*, mirrors the Red Teaming Handbook’s definition and adds that red teams provide “a check on the natural tendency of friendly forces to “mirror image” the adversary (i.e., to ascribe to an adversary the same motives, intent, and procedures that guide friendly forces).”¹⁴

Regardless of its specific application, the common goal of red teaming is “improving decision making through critical thinking and analysis.”¹⁵ If considered more specifically within the context of operational design, the red team’s ultimate goal is to strengthen the commander’s decision analysis capability. Effectively challenging planning assumptions, mitigating operational risk, and identifying then exploiting emergent opportunities is often referred to as ‘decision support red teaming.’ This type of activity tends to be aligned with the DSB’s “Devil’s advocate” and “advisory board” categories of activity. This type of red team activity should be woven throughout the Joint Operations Planning Process (JOPP) and serves as the overarching intent of the red team’s alternative and independent analysis. The success of this overarching activity relies, in part, upon sound operational level threat emulation along the lines of the DSB’s surrogate adversary category. The red team’s role as a surrogate adversary is especially important during latter phases of the JOPP as the red team works to flesh out decision support matrices by analyzing the adversary’s operational level action: its plan/decide/execute (PDE) cycle, intelligence collection and analysis capability, employment capability, and valid indicators of intent.

Chapter 3: Red Teaming Shortfalls and the Way Forward

Despite broad consensus that red team analysis is valuable, it also remains underused. The DSB noted in a 2009 report, “Despite its value, effective red teaming, especially above the tactical level, has proven difficult,”¹⁶ and “has yet to become a cultural norm for DOD.”¹⁷ Difficulty inculcating red teaming into operations planning is caused by: a lack of overarching doctrinal guidance for its role in planning, organizational resistance to red team activity in some cases, and insufficient guidance or techniques for organizing and operating red teams during operations planning. Despite these challenges, examples of progress and a commitment to promoting effective red teaming exists with the professional military education curriculum and operations planning communities.

Within the context of operations planning, the red team’s role is often associated with that of a surrogate enemy during wargaming. This association has roots in kreigspiel (wargaming) developed in the early 19th century to train Prussian officers, and survives in current Joint doctrinal guidance. The constitution and role of red teaming is severely circumscribed by JP 5-0, *Joint Operations Planning*. JP 5-0 discusses red team, or red cell, activity strictly within the bounds of wargaming, and poorly at that. It states, “A robust cell that can aggressively pursue the adversary’s point of view *when considering adversary counteraction is essential [emphasis added]*,” suggesting, perhaps, that there are situations in which the adversary’s actions can be ignored. JP 5-0 further limits and misinforms red team activity, “*If formed [emphasis added]*, the cell would work for the joint headquarters J-2 and typically would reside in either the joint intelligence support element or the joint planning group (JPG). The red cell develops critical decision points relative to the friendly COAs, projects adversary reactions to friendly actions, and estimates adversary losses for each friendly COA. By trying to win the wargame for

the adversary, the red cell helps the staff fully address friendly responses for each adversary COA.”

To begin, JP 5-0 suggests that the red team is an intelligence centric activity and the responsibility of the J-2. Instead, the red team should consist of trained and practiced members possessing a breadth of experience from across the planning staff (i.e. intelligence, operations, logistics, etc.), from both joint and functional staffs, and from outside agencies. A well formed red team must include intelligence expertise, but that cannot be the limit of its expertise. Additionally, red team activity involves more than identifying an enemy’s decision points, reactions, and losses. This guidance seems to suggest that our adversaries are relatively static entities waiting to be acted upon instead of motivated and adaptive people who seek to maintain a measure of the initiative. Finally, stating that the red team’s goal in wargaming is “to win the game for the adversary” runs contrary to any sound guidance on the purpose of wargaming. The red team’s role is neither to ‘win’ the wargame nor, worse yet, simply “validate the army’s approved doctrine” to “make the troops feel good about the training they received.”¹⁸ Instead, the red team should serve as a source of independent analysis that can challenge a plan as a complex and adaptive adversary would challenge it. ‘Blue team’ defeat in wargaming suggests that its tested COA was probably invalid¹⁹ given the adversary’s intent or capability, and moreover, that the red team failed to adequately influence COA development during earlier stages of the JOPP.

In addition to poor doctrinal guidance, organizational resistance can also hamper the red team’s utility. Resistance can occur for a variety of reasons. In a 2009 report, the DSB noted continued difficulty building red team capability above the tactical level. As causes, the DSB cited: a lack of top level support, that “red teaming can be threatening to many in an

organization,” and that red team activity is “remote from the decision-making process that it is intended to inform.”²⁰

Malone’s and Schaupp’s “*The ‘Red Team’ Forging a Well-Conceived Contingency Plan*” concisely sums these issues stating, “As the Red Team prepares to integrate into the planning effort, it must acknowledge a simple fact: very few people perceive a review and assessment of their efforts as benign.”²¹ They argue that red team ‘acceptance’ requires a combination of the commander’s clear sponsorship and red team credibility based on experience and expertise. Their assertion regarding the commander’s role in guiding and sponsoring red team effort squares nicely with the concept of operational design as a commander driven process. The staff, red team included, serves to build the commander’s plan. The red team’s role should compliment, not counter, the overall planning process.

Two factors significantly influence whether red team efforts are seen to compliment the overall planning effort: early involvement and valid threat emulation. As noted above, the failure of a ‘blue’ COA to survive wargaming indicates a failure of the red team’s alternative analysis to identify the COA’s fatal flaws earlier in the JOPP. Prescient red team analysis, offered too late, is counterproductive, particularly in crisis action planning. In addition, the red team’s analysis and threat emulation must fall within the ‘left and right boundaries’ of what is reasonable. This is not intended to suggest that the red team’s independent analysis be circumscribed in its creativity or willingness to challenge a commander’s point of view. Instead, Fontenot and Combs suggest that, “Valid threat emulation should allow for reasonable parameters within which the emulators may act in the best interest of the threat they represent.”²² Every military action possesses inherent risk. The red team served to address and mitigate that risk, not scuttle plans with an unrealistic or illogical assessment of an enemy’s potential actions.

A third issue hampering effective red team usage is the lack of practical guidance for its employment. “[D]espite its recognized importance “red teaming” is not recognized as a separate discipline and very little documentation is available about how to actually create a Red Team and make it effective.”²³ Like any other military capability, red teaming requires training, practice, and a commonly accepted framework for how to make ‘rubber meet the road’. Fortunately, as the positive correlation between successful outcomes and a willingness to ‘risk critique’²⁴ becomes increasingly apparent, red team training has matured. The Army’s University for Foreign Military and Cultural Studies (UFMCS) at Fort Leavenworth serves as a leading example of the DOD’s commitment to building red team capacity.

The U.S. Army’s Training and Doctrine Command (TRADOC) opened UFMCS in 2004 to help establish red teaming as “a separate and continuous discipline with professional standards and education.”²⁵ Primarily focused on building decision analysis red team capacity, the UFMCS curriculum addresses threat emulation as well. As suggested earlier, a critical link exists between threat emulation and decision support red teaming. This linkage, discussed in detail in the next chapter, is critical to improving decision analysis in support of operations planning.

The UFMCS works to provide its students with a sense of apperception—a “full awareness of who they are and how they perceive the world,”²⁶ to engage problems without the constraint of ethnocentrism. Apperception sets the stage for problem framing and decision analysis that incorporates the adversary’s point of view. Beyond simply modeling an adversary’s military capability, decision support red teaming, grounded in objective apperception, helps build a picture of the operating environment informed by culture, regional and global relationships, religion, and other factors. With that framework in place, decision support red teams can begin to understand an adversary’s decision making process.

Similar efforts to promote red teaming directly, or the cross-cultural foundations that support it, can be seen in other branches of the military, other security agencies, and among allies. The Sandia Laboratories' Information Design Assurance Red Team (IDART), for example, establishes red teaming as an "authorized, adversary-based assessment for defensive purposes."²⁷ Recent papers by Dr. Alan Ryan and Matthew Lauder each call for increased red team activity in Australian and Canadian defense respectively. Lauder's 2009 article in the Canadian Army Journal cites a "paucity of data on the effectiveness and efficacy of red teaming as a process."²⁸ This is a valid observation as most of the literature regarding red team usage cites anecdotal successes and provides little in the way of guidance for effective red team employment or empirical evidence to demonstrate its utility.

That well crafted doctrine would spur a quick and collective effort toward increased red team effectiveness is unlikely. Doctrinal guidance should be advanced to broaden and more clearly define how red teams support the JOPP. Any rigid prescription of usage should be avoided, as commanders require the flexibility to tailor planning processes to meet mission demands. The commander's willingness to 'risk critique'²⁹ and allow a healthy measure of friendly opposition promises to improve decision analysis and the likelihood of mission success. In addition to commanders' support, red teaming must be recognized as a discipline requiring training, practice, and playbook for employment. Finally, a framework must exist to focus red team activity on decision analysis, and integrate that effort throughout the JOPP.

Chapter 4: How Red Teaming Supports Decision Analysis

Well executed *decision analysis* is central to developing operations plans that are grounded in a clear understanding of strategic and operational risks, assumptions, and opportunities. Stunning advances in our ability to observe an adversary have not lifted the fog of war. Faced with a thinking and adaptive adversary, Molke's axiom that "no battle plan survives first contact with the enemy" too often rings true. Understanding the red team's role in support of decision analysis first requires a clear understanding of decision analysis itself, and how decision analysis enables commanders to both mitigate and articulate an operation's inherent risks. A closer examination of Field Marshal Slim's decision to abandon his original plan for decisive battle on the Shwebo plain provides an example of how threat emulation and decision support red teaming work in concert to support decision analysis.

Decision Making Analysis versus Decision Analysis

Within the context of operational design, it is important to first differentiate between *decision making analysis* and *decision analysis*. Decision making analysis refers to understanding an adversary's or adversarial system's process for making decisions. It is one of many activities aimed at improved decision analysis. Decision making analysis may be affected by any number of considerations from culture and religion, to the adversary's interrelationships with other countries, to the level of motivation toward achieving a particular political end state. Improved decision making analysis is one aspect of red teams' support to the planning process. Red teams require the expertise and capacity for the apperception discussed above to provide decision making analysis. "When the [red team] has the ability to replicate the adversary's decision making model, it substantially enhances the effectiveness of wargaming and builds a key perspective for the JFC to make friendly force decisions."³⁰

Operational design is a leader driven process centered on problem framing. Through problem framing, commanders and their staffs work to clearly define the problem at hand in terms of desired end states, national and military objectives, desired and undesired effects, assumptions, and consideration of risk. Problem framing supports the development of strategy manifested in courses of action designed to link military task to national ends (Figure 1).

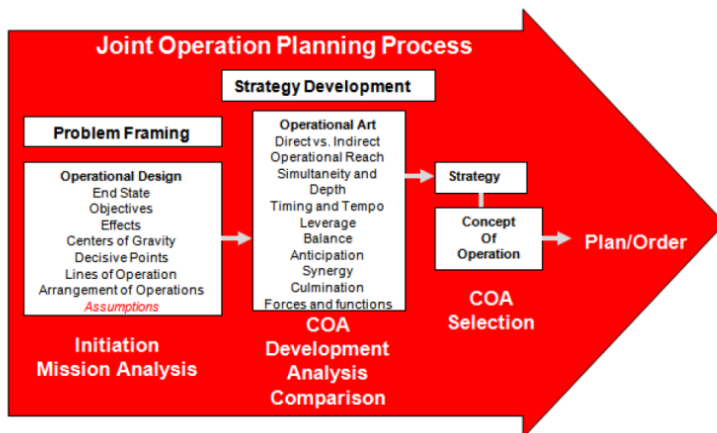


Figure 1: JP 5-0's seventeen elements of operational design separated into "distinct elements of operational design and elements of operational art, and their relationship to the JOPP."³¹

However, problem framing and strategy development alone do not guarantee an operation's success. Warfare, by nature, is fraught with uncertainty—Clausewitz's fog and friction. The practice of decision analysis within the intellectual framework provided by Dr. Ronald A. Howard provides a means to address this uncertainty. Howard's recent article, aimed at refining the language associated with decision analysis, describes some of its components: *characterization* of a problem before facing a decision, *choices* driven by probability and possibility, and the *wisdom* of seeking a preferred future state without overemphasis on past events.³² Success hinges upon decision analysis that supports a combatant commander's ability to identify and manage any operation's inherent risks. Commander's are responsible for not only

mitigating risk within the scope of a particular theater-strategy or operation, but also articulate links between operational level action, theater-strategy, and broader national strategy to senior national leaders (Figure 2).

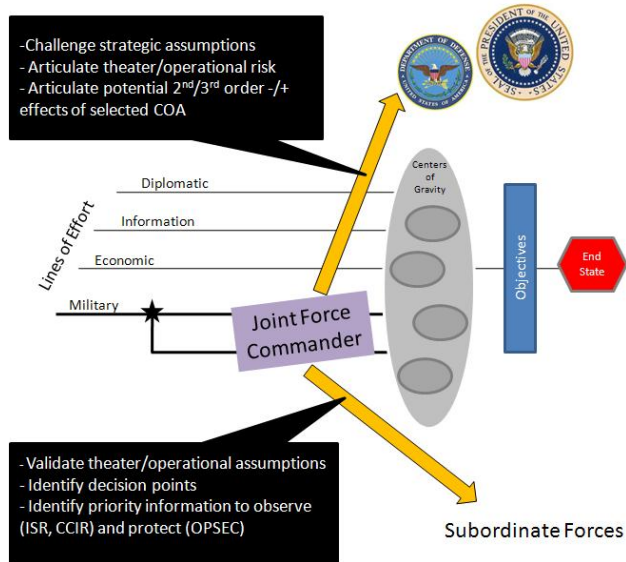


Figure 2: Illustrates the role of decision analysis in supporting the JFC's ability to articulate risk to up the chain of command and mitigate risk faced by subordinate forces.

Description of military risk provided by British doctrine provides a useful parallel for differentiating between commanders' theater-strategic and operational level concerns. Britain's JP 5-00, *Campaign Planning*³³ describes strategic risk as that which can jeopardize achievement of desired strategic outcomes. Risk at this level may undermine legitimacy, undermine international or domestic resolve, or damage the cohesion of a coalition. In contrast, operational risk is that "arising during campaign execution, either through external events or influences (such as a change in political circumstances) or through the performance of the joint force (which may include unexpected successes as well as unwelcome reverses). The most likely consequence of operational risk is that a JFC's freedom of action is curtailed."³⁴

Decision analysis better enables commanders to articulate the links between operational action, theater strategy, and overarching national or multinational strategic objectives.

Successful campaign planning demands that commanders clearly articulate how an operation's inherent risk can affect the achievement of desired theater and national end states.

The importance of clearly discerning these links cannot be understated as evidenced by challenges faced during Operation Iraqi Freedom.

“In retrospect, assessment of the planning for OIF must focus on the way the set of assumptions made by US Government officials and military commanders about the postwar situation in Iraq shaped the planning process. All military plans rest on a set of assumptions to a greater or lesser degree, and the famous dictum that “no plan survives contact with the enemy” would clearly apply in the spring of 2003. While planners can never expect their conjectures to be wholly accurate, they are supposed to be lucid, well-reasoned assumptions based on intelligence, commander's guidance, doctrine, and policy.”³⁵

Likewise, decision analysis facilitates a commander's ability to mitigate risk and exploit opportunities. Decision analysis focuses on shaping *decision criteria* that inform actions at an operation's *decision points*—“a point in space and time when the commander or staff anticipates making a key decision concerning a specific course of action.”³⁶ The strategy development, wargaming, and staff estimates directed at decision analysis result in production of decision support templates (DST) and decision support matrices (DSM) that form a ‘commander's playbook’ for decisions synchronized across lines of effort directed at a common end state. “Although JFCs will always have to rely on coup d’oeil, decision analysis aided by a DSM reduces the risks of ineffective or poorly thought out plans and decision points.”³⁷ Figure 3 illustrates an example DSM for commitment of an operational reserve force.


DP	TAI	NAI	Event	Decision Req	Decision Criteria	Assets	CJTF Actions
 FEBA A	#1	#1	Vul forces engage FEBA A in strength along coastal AA and operational exploitation forces (OEF) moving toward coastal AA	Authorize JFLCC to issue Warning Order to Op. Res. (MEB) to block penetration of FEBA A along coastal AA CHOP MEB to JFLCC	Vul forces threaten Bde size penetration of FEBA A Vul OEF preparing to move 316 th Armor Bde vicinity NAI 1 Perseus' forces at < 80% strength	LCC ACC MCC SOF Perseus and Auriga Forces	Authorize preparation actions to CHOP MEB Issue Warning Order Revise CJTF Guidance Ltr. Submit ATO input Issue Warning Order CHOP MEB
WARNORD							
			Perseus' forces unable to block penetration of VUL forces FEBA A penetrated by Vul 1 st Echelon Bde	Deploy MEB ashore Authorize JFLCC to commit MEB to block penetration of FEBA A along coastal AA	Vul Bde at >70% strength has penetrated FEBA A Air and fires are insufficient alone to stop penetration Perseus' forces < 70% strength Perseus' reserve already committed	LCC ACC MCC SOF Perseus and Aurigan Forces	Issue Execution Order to CJTF and Coalition forces Redesignate operational reserve
Execute Order							
Notes: Assume maximum enemy movement rate (mounted) in contact to be .5 Km/Hr Est. Vul movement time between FEBA A and FEBA B 24 Hrs Est. minimum preparation time for MEB to block Vul penetration of FEBA A 24 Hrs							

Figure 3: This example DSM illustrates the linkages among a known decision point (the commitment of an operational reserve to stem an enemy offensive); the decision point's associated decision criteria, and required commander's actions. This particular example breaks out criteria for the issuance of both the WARNORD and EXORD required to commit forces.³⁸

The independent analysis afforded by robust red team activity, woven throughout the JOPP, exists to improve the credibility and value of decision analysis. To accomplish this goal, the red team must satisfy the commander's requirements for broad theater-strategic level analysis as well as operational level threat emulation aimed at detailing well reasoned decision support matrices. Defining the red team's focus in these terms invites debate; debate about the definition of each level of war, and about the limits of any staff's scope of responsibility. Effectively linking strategy to task at the geographic combatant commander (GCC) or joint task force (JTF) levels requires planners to maintain a field of regard spanning all levels of war; from the grand strategic to the tactical action of each "strategic corporal."³⁹ While maintaining a comprehensive field of regard, the normal field of view for GCC and JTF planners is on their commanders' theater-strategic concerns and the operational level action taken in support of the theater strategy (Figure 4).

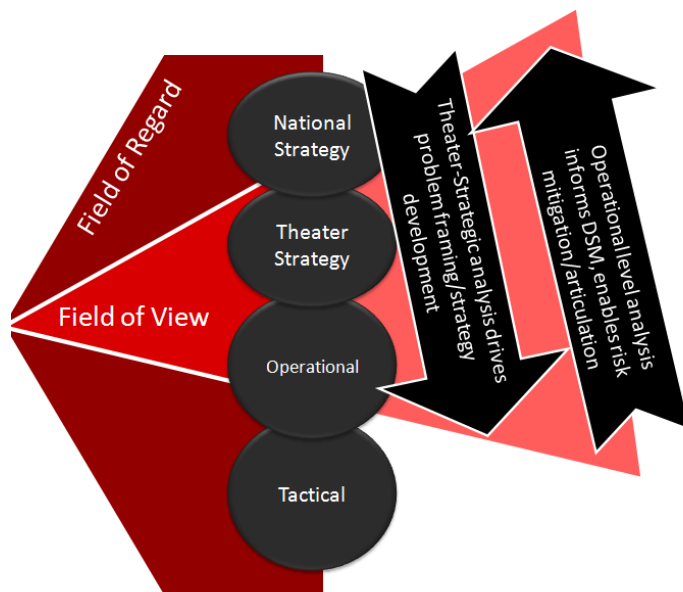


Figure 4: This figure illustrates how analysis within the red team’s normal field of view supports planning across the JFC complete field of regard that spans every level of war.

Field Marshal Slim’s Decision Point on the Shwebo Plain

Soon after initiating his 1945 counteroffensive to recapture Burma from the Japanese, Field Marshal Slim faced a classic decision point. Slim’s plan to bait the Japanese into a battle on terrain favoring British armor, the Shwebo Plain north of the Irrawaddy river, rested on the assumption that Japanese decision making would hold true to the form Slim had come to expect—that the Japanese would not cede the plain without a fight. In planning his operation, Slim had no means to determine his adversary’s defensive plan, and it is unlikely that his staff included a formal red team dedicated to assessing Japanese strategy or emulating their operations. However, a review of this operation illustrates how red team analysis supports decision analysis within the framework of operational design.

After crossing the Chindwin River, Slim’s 19th Division made surprisingly rapid progress across a series of hills shielding the northern Shwebo. Stoutly fortifying these hills could have slowed the British advance and allowed Kimura time to prepare for battle, but the 19th found

Japanese positions in the hills ill suited for prolonged defense. Additionally, aerial reconnaissance indicated that the general movement of Japanese forces on the Shwebo was southward toward the Irrawaddy, away from the advancing British. In another context, these developments would have seemed positive. In this case, they served as clear indicators that Slim's assumption was beginning to prove false. Continuing to commit his forces to the Shwebo would put them at great risk— at the end of long line of communication stretching west to India and facing an opposed river crossing against a well prepared defense. By accurately reading Kimura's reaction to his advance onto the Shwebo, Slim was able to order execution of his branch plan. This timely action mitigated the risk to his force, exploited an emergent opportunity, and ultimately achieved his strategic objective—the destruction of Japan's Burma Area Army.

The critical decision point Slim faced as his forces advanced to the Shwebo provides an example of how a red team's theater-strategic and operational levels of analysis can work hand-in-hand to support decision analysis. Figure 5 illustrates important aspects of Slim's operation to include its ends, objectives, and decisive points.⁴⁰

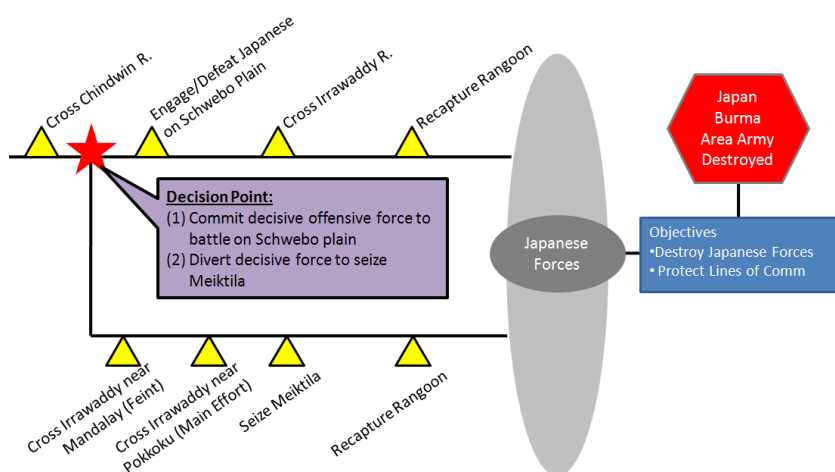


Figure 5: This abbreviated cognitive map of Slim's counteroffensive illustrates several aspects of his counteroffensive aimed at the destruction of Japan's Burma Area Army, most notably the decision point he faced as his forces entered the Shwebo Plain.

Suppose that during COA development and analysis Slim's red team worked to test the assumption that the Japanese would defend the Shwebo Plain, or, worse, that planning efforts had failed to recognize the assumption at all. Independent red team analysis may have questioned the likelihood of a Japanese stand on the Shwebo based on analysis of Kimura's strategic situation:

- Japan's Burma Area Army was severely weakened following the 1944 defeat at Imphal-Kohima, and less capable of combat on open terrain than Slim expected.
- Japan's overall theater strategy called for holding Malaya and Singapore over Burma. Kimura was ordered to hold *southern* Burma as the northern flank of the South-East Asian defense zone.
- Allied interdiction had reduced Kimura's supplies to a trickle; making an advance across the Irrawaddy to meet Slim on the Shwebo plain logistically as well as tactically risky.
- The most 'cost effective' defense of both central, and ultimately southern, Burma could be made by halting the British on the Irrawaddy's shore.

Under these strategic circumstances, Kimura's withdraw from the Shwebo was realistic and logical. Because of the significant risk it presented to Slim, its consideration would have been required for continued planning.⁴¹ The success of both Slim's primary and branch plans rested on early identification of whether Kimura intended to engage in a decisive battle north of the Irrawaddy, or retreat to defense redoubts to its south.

In testing this assumption during COA analysis, the red team would have emulated Kimura's withdraw, prompting the 'blue team' to consider the decision point highlighted in Figure 5. During wargaming's cognition phase, the detail analysis provided through the red team's threat emulation role becomes particularly valuable. At this stage, 'blue' and 'red' planners would have worked in concert to identify:

- The effect of time on the decision making process. Most importantly, what is the latest point at which the British can elect to execute the branch plan without having to pull forces west, back across the Chindwin River?
- Japanese actions that would indicate their intention to remain on the Shwebo or withdraw to the Irrawaddy and be observable by British forces (e.g. aerial observation of troop movements, preparation of captured defenses, tenacity of defense).
- What can the Japanese observe about British movement? (In this case, the Japanese had limited aerial reconnaissance and relied on radio intercepts. So the British protected 4 Corps movement through the

Gangaw valley with fighter patrols and executed a military deception campaign by standing up a fake command post on the Shwebo to control 4 Corp forces that were not there.)

This analysis would have been captured in a DST and used to create an associated DSM.

This operational level analysis would have also fed an assessment of the theater-strategic risks associated with Slim's branch plan. Splitting his forces and sending the 4 Corps around Japanese defenses near Mandalay presented several risks.

- The branch plan robbed Slim of the strength derived from maintaining interior lines of operation and a direct, land based, logistics link to his supply bases in India.
- The branch plan required masking Slim's intent to strike Meiktila. This required a deception operation to convince Japanese forces that Slim's decisive force had been committed to the Shwebo plain. In short, Slim's reaction to the Japanese withdraw had to avoid the "paradox of warning."⁴²
- The branch plan required 4 Corps' rapid advance across the Irrawaddy and onto Meiktila. The speed of advance demanded that logistic requirements would have to be satisfied by the theater's limited airlift assets. This branch plan, therefore, posed a significant risk that Slim had to clearly articulate to higher level commanders who controlled the allocation of scarce airlift assets between Slim's forces and American/Chinese operations elsewhere in the theater.

This example demonstrates how red teams' focus across both the theater-strategic and operational levels work in concert to bolster decision analysis. Overarching strategic analysis helps to frame problems and drive strategy development while more detailed operational level threat emulation feeds important risk information back to upper level decision makers.

Understanding this interplay and its ultimate goal of bolstering decision analysis sets the stage for integrating red team activity throughout the JOPP.

Chapter 5: Integrating the Red Team into the JOPP

Effective red teaming requires not only an understanding of how the team supports decision analysis, but how to integrate that support throughout the JOPP. Red team members must “understand the planning process in order to know *how and when to influence the planning process*.”⁴³ The red team cannot exist as simply a surrogate enemy during COA analysis wargaming. Instead its work must be synchronized with the overall interaction between commander and staff. Additionally, the nature and timing of the red team’s interaction with ‘blue’ planners affects the balance between maintaining a more independent and sequestered red team, and a less sequestered team that interacts more frequently with ‘blue’ planners.

Dr. Jeffrey Reilly’s framework for operational design presents three critical junctures within the JOPP that significantly influence the effectiveness of decision analysis. Figure 6 highlights these three junctures: between mission analysis and the commander’s direction for COA development when the commander dictates the overall theater strategy, during COA analysis and wargaming, and during DSM generation that follows COA approval.⁴⁴ Reilly’s analysis squares nicely with the three most significant points of red/blue interaction suggested by Malone and Schaupp in their paper centered on USAFE’s red team efforts. They suggested that red team involvement begin as close to mission initiation as possible, and that red/blue interaction should occur at three key points: in a review of blue mission analysis products, during COA wargaming, and during plan or order development in what they call a “plan wargame.” This plan wargame differs from COA wargaming because of the level of planning detail and correlates with the Plan/Order Development phase of the JOPP.

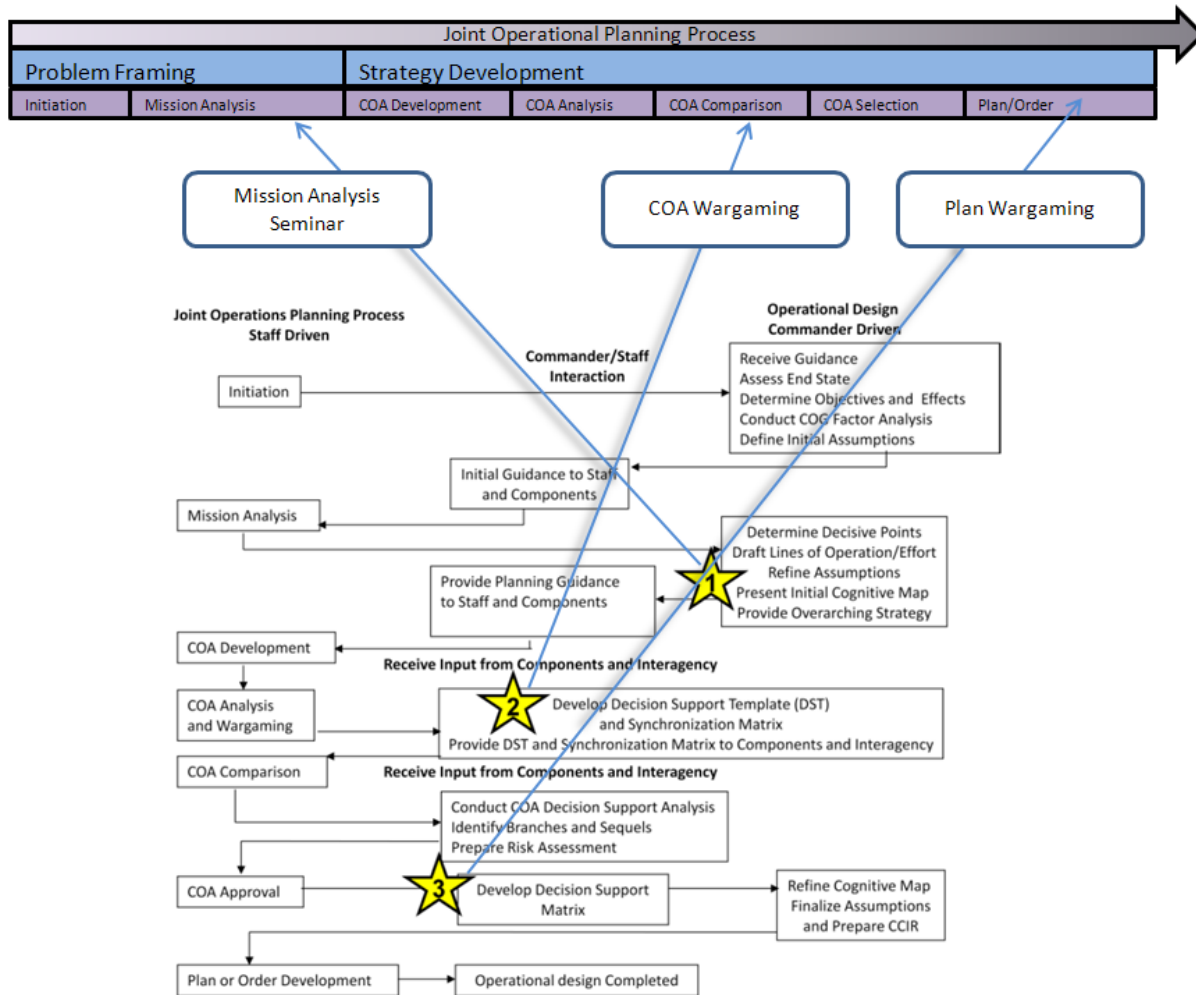


Figure 6: Adapted from Dr. Jeffrey Reilly’s diagram highlighting the “three critical junctures in the JOPP where operational design has the potential to significantly influence the effectiveness of decision analysis”⁴⁵ (numbered stars). This figure illustrates the linkage between these three junctures, the three primary red team interaction points suggested by Malone and Schaupp, and how these points synchronize with the JOPP.

The three main junctures suggested by these two models mirror one another in terms of when they occur during the JOPP and the focus and function of each interaction. As the JOPP transitions from problem framing through strategy development (Figure 1) the focus of planners’ efforts will naturally trend toward more detailed analysis (Figure 7). Slim’s planners, for example, would have likely focused on Kimura’s overarching strategy in their mission analysis, this analysis would have informed Slim’s COA development, and in order development the red team’s analysis of specific observable Japanese action would have populated Slim’s DSM.

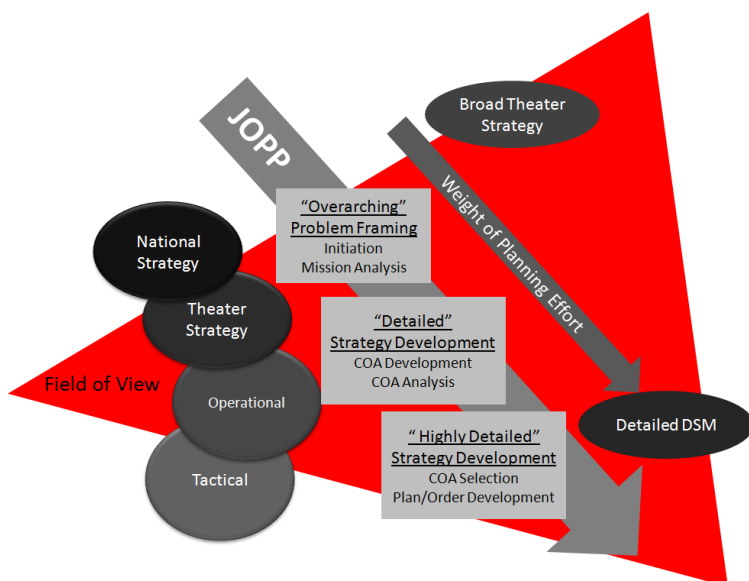


Figure 7: Illustrates the shift in the weight of the red team's analytic effort as the JOPP moves from problem framing through strategy development.

Understanding how the interaction between both 'red' and 'blue' planners and the commander at these junctures affects decision analysis is a good stepping off point from which to consider specific red team analytic tasks during each phase of the JOPP and how much interaction should occur between 'red' and 'blue' side planners. Figure 8 details many of the red team's functions: across the theater-strategic to operational 'field of view' and throughout the joint planning process. This diagram is not intended as a prescriptive checklist of red team activity. Instead, it serves to highlight the mutually supportive nature of red team activities across a staff's 'field of view' and throughout the planning process.

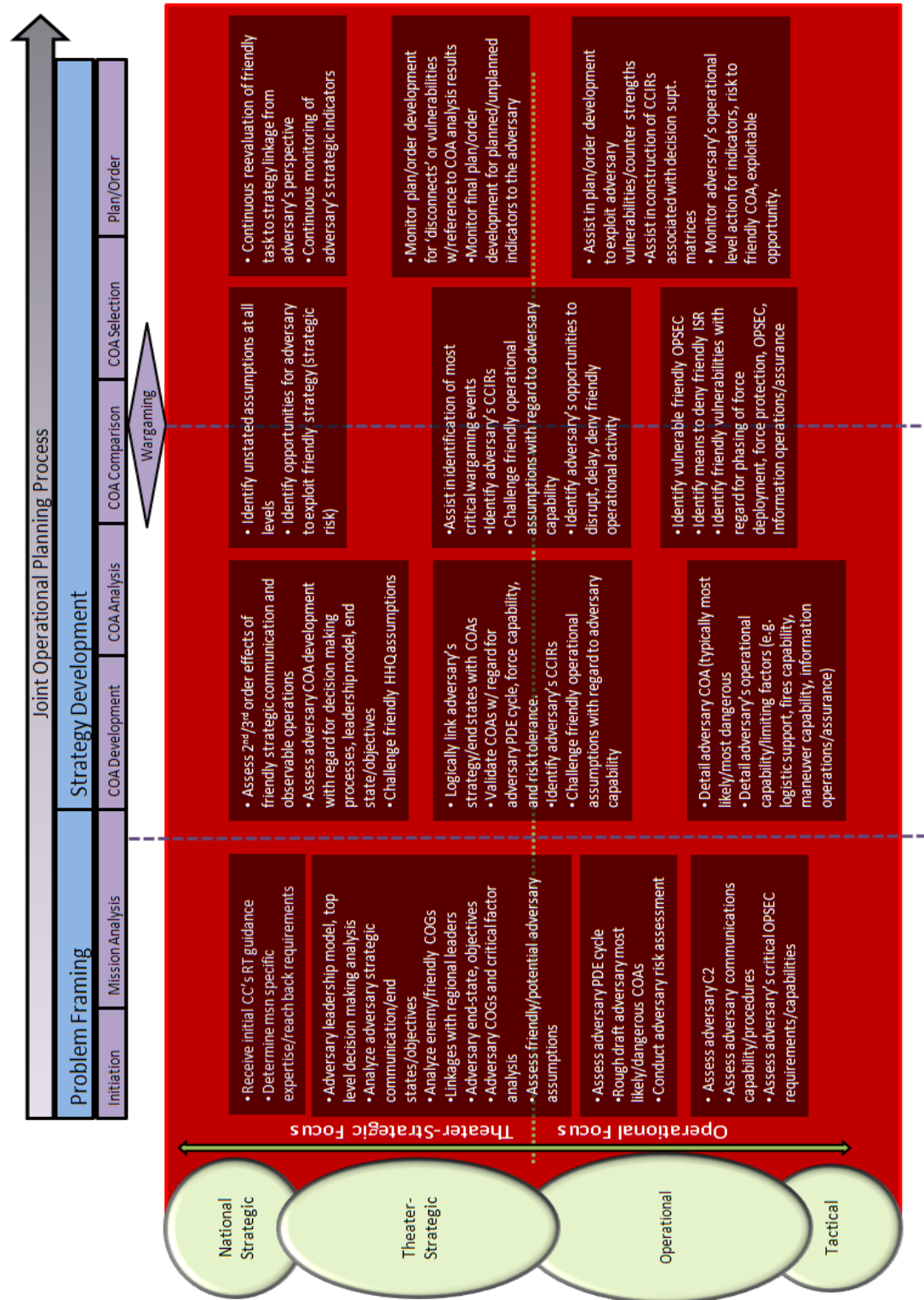


Figure 8: Illustrates specific red team analytic tasks at each stage of planning with correlated with respective levels of analysis.

Chapter 6: Staff Interaction and Red Team Constitution

A clear understanding of how red team activity supports decision analysis and integrates with the JOPP enables properly tailored interaction between red and ‘blue’ planners and effective red team constitution. Commanders must assess and dictate the timing and amount of interaction between their red team and the rest of their staff, and select red team members to meet specific mission requirements.

Red/Blue Interaction: Two Schools of Thought

Two schools of thought exist regarding the amount of interaction between ‘blue’ and ‘red’ planners. On one hand, much of the value inherent in red team analysis comes from its independence. Under perfect circumstances, commanders could comprehensively model the key elements of an adversary’s decision making and leadership system to develop potential adversary actions sequestered completely from friendly influence or perspective. This approach protects the red team’s independent analysis from ‘blue’ side influence and vice versa. Sequestering probably best enables the red team to challenge the ‘Western military perspective’ from the adversary’s point of view. The second school of thought suggests that red and blue interaction should be nearly continuous. Under this model, the red team exists as a source of friendly opposition to “murder board” the blue plan throughout its development. Both approaches present pros and cons, and it is up the commander to tailor red team activity to meet mission requirements.

Probably the most influential factor for engineering red/blue contact is the time available for planning. Long range contingency planning for potential operations against a complex adversary or set of adversaries would lend itself to a more sequestered red team. In contrast, short range crisis action planning (CAP) requires more intensive red/blue interaction. That is not

to suggest that in CAP the red team's analysis is held prostrate by 'blue' plans. Instead, the red team's activity must be more carefully focused on the points of decision analysis that most directly influence mission success.

In many cases, the balance between independent analysis and ongoing peer review by the red team can be struck by maintaining limited but constant contact. That contact can be maintained by select members of the red team whose role it is monitor but not necessarily influence 'blue' planning efforts. Their observations help inform more sequestered red team analysts working to shape products for the three critical decision support junctures mentioned above. Depending upon the situation, for example a long range contingency versus a violent and immediate crisis, those red team 'liaisons' could meter the timeliness and detail of red team planning input.

The Army's Red Team Handbook identifies several challenges faced by the red team in maintaining its independent analysis to include remaining independent but accountable to staff requirements and avoiding the inherent tension of providing alternative, and often critical, analysis of the work done by other planners.⁴⁶ The Handbook suggests that addressing the level of red/blue interaction upon mission receipt can prevent problems later on. Red team leaders should work with the commander to determine:⁴⁷

- When the red team should engage in the planning process?
- How that engagement should take place and to whom does the red team report?
- How does the red team support wargaming, directly serving as the adversary or indirectly in an advisory capacity?
- Who can the red team use to help develop its analysis; from within the staff and from outside sources of expertise?

Red Team Constitution

The scope and variety of red team activity requires a variety of expertise to match. It is unlikely that any planning staff will possess sufficient resident expertise to master all the cultural

and technical competencies required to fully model an adversary. Instead, red teams will likely consist of a small subsets of planners trained in red teaming principles and functions. Such core red teams must not only possess a measure of apperception, an ability to set aside the friendly perspective and attempt to comprehend the adversary's perspective, but it must understand how that perspective functions to support decision analysis.

Higher order considerations, such as the second or third order effects of strategic communications on the adversary's decision making process, will require a vastly different skill set than, say, identifying indicators of operational intent rooted in unit level tactics. The core red team has the responsibility to identify the specific analytic requirements that support decision analysis, and then identify subject matter experts who can provide credible analysis. Meeting this responsibility requires red teams drawn from a cross-section of joint and functional staffs, and be tailored to the specific planning task at hand, not a homogenous group of planners from just one level of command or functional area. For example, the expertise required in planning an NEO or humanitarian relief operation would differ from a COIN or major combat operation. While required expertise will often be found from within the Joint Operations Planning Community, the red team must be willing and able to access other sources such as academia, an adversary's ethnic diaspora, or cultural and technical experts outside the planning community.

Establishing red teams tailored for the mission at hand, trained to conduct red team activity as a professional discipline, and aware of their role in supporting decision analysis across the staff's theater-strategic to operational 'field of view' are crucial steps toward improving red team's use in operations planning.

Chapter 7: Conclusion

The challenges faced by the United States and its allies since 2001 attest that the long term success of military operations requires more than advanced weapons and an a measure of hubris. Achieving the stability, peace, and security we desire will require careful evaluation of our intended ends and courses of action to achieve those ends from the perspective of our adversaries. This axiom holds true whether confronted with a major combat operation versus another state or a long, low intensity struggle against a loose confederation of violent individuals linked by little more than an ideology of hatred.

Infusing a measure of apperception provided by red teaming throughout the planning and execution of our operations is a vital facet of decision analysis and operational design which form the intellectual backbone of the existing JOPP and emergent structure of adaptive planning. While integrating operational design into the JOPP has provided a methodical foundation for linking strategy to task, truly effective operational design links the design process with decision analysis. That link necessitates a robust red team whose action and analysis is integrated throughout the JOPP and includes more than providing a surrogate enemy for wargaming.

Effectively integrating the alternative analysis afforded by red teams requires recognition of red teaming as a unique professional discipline. Like any professional discipline, red teaming requires formalized training, practice, and standards of effective performance. For those planners tasked to develop theater level campaigns, a clear understanding of how the red team enables effective decision analysis through critical thinking at both the theater-strategic and operational levels of war. Finally, red team activity must be integrated throughout the JOPP and tailored to meet the commander's situational needs.

In an increasingly complex security environment, that more frequently than not generates conflict characterized by “wicked problems”⁴⁸ alongside “war amongst the people”⁴⁹ conflicts involving irregular forces, in which political and military actions intermingle, and in which a conclusive political result is elusive, the analysis afforded by red team effort becomes increasingly valuable.

Endnotes

- ¹ Slim, William J.S. *Defeat into Victory: Battling Japan in Burma and India, 1942-1945*. 1956. (Reprint, New York: Cooper Square Press, 2000), 425.
- ² Longbine, David F. "Red Teaming: Past and Present." School of Advanced Military Studies Monograph, U.S. Army Command and General Staff College, 2008. Longbine suggests three core red teaming principles: challenging an organization's thinking, alternative analysis, and alternative perspective. His monograph discusses how Field Marshal Slim application of these core principles affected the course of the World War II in Burma.
- ³ Slim, 391.
- ⁴ Ibid, 415.
- ⁵ Ibid, 143.
- ⁶ Allen, Louis *Burma, The Longest War 1941-45*. (New York: St. Martin's Press, 1984), 406.
- ⁷ Ibid, 407.
- ⁸ Slim, 453.
- ⁹ Ibid, 20.
- ¹⁰ U.S. Department of Defense. *Quadrennial Defense Review Report, February 2010*. <http://www.defense.gov/QDR/> (Accessed, 17 March 2010) 5-9.
- ¹¹ Ted Gold and Bob Herman. *Report of the Defense Science Board Task Force on The Role and Status of DOD Red Teaming Activities*. Defense Science Board Task Force, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics (Washington DC: September 2003) <http://www.au.af.mil/au/awc/awcgate/dod/dsb-redteam.pdf> (Accessed, 17 March 2010)
- ¹² Colonel Gregory Fontenot, USA (ret); Colonel Darrell L. Combs, USMC (ret), "Fighting Blue: Why First Class Threat Emulation is Critical to Joint Experimentation and Combat Development," *American Intelligence Journal* 26, no. 2 (Summer 2008): 25.
- ¹³ Longbine, 6. Quoted from, *Red Team Handbook, Version 3 Draft* (University of Foreign Military and Cultural Studies, 19 January 2007) Fort Leavenworth, Kansas: U.S. Army Training and Doctrine Command, 9.
- ¹⁴ Joint Publication 2-0 *Joint Intelligence*, 22 June 2007, I-26. JP 2-0, I-26 JP 2-0 expands this discussion, The use of "red teams" is critical to the ability of commanders and their staffs to understand the adversary and visualize the relevant aspects of the operational environment. Red teams are organizational elements comprised of trained, educated, and practiced experts that provide an independent capability to fully explore alternatives in plans and operations in the context of the operational environment and from the perspective of adversaries and others. Red teams assist joint operation planning by validating assumptions about the adversary, participating in the wargaming of friendly and adversary COAs, and providing a check on the natural tendency of friendly forces to "mirror image" the adversary (i.e., to ascribe to an adversary the same motives, intent, and procedures that guide friendly forces)." (I-26)
- ¹⁵ Longbine, 7.
- ¹⁶ Miriam John and Robert Stein, *Report of the Defense Science Board Task Force on Capability Surprise Volume I: Main Report*, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics, (Washington DC: September 2009), 44, <http://www.carlisle.army.mil/DIME/documents/2009-09%20Capability%20Surprise%20Report%20DSB.pdf> (Accessed, 17 March 2010)
- ¹⁷ Ibid, xiv.
- ¹⁸ Shelley Kirkpatrick "Staying One Step Ahead: Advancing Red Teaming Methodologies through Innovation," (Arlington, VA: Homeland Security Institute, 8 February 2005), 45. In citing historic red teaming successes and failures, Kirkpatrick references Dr. Williamson Murray's "Red Teaming: Its Contribution to Past Military Effectiveness" from a Hicks and Associates Working Paper (#02-2), September 2002, p. 9. Dr. Murray points out that, "French wargames in the interwar period were conducted to "validate the army's approved doctrine" and "make the troops feel good about the training they received." Emulation of a robust adversary was poor."
- ¹⁹ Joint Publication 5-0 *Joint Operation Planning*, 26 December 2006, Fig. III-6, p. III-28. JP 5-0 defines a valid COA as adequate, feasible, acceptable, distinguishable, and complete.
- ²⁰ *Report of the Defense Science Board Task Force on Capability Surprise Volume I: Main Report*, 44.
- ²¹ Timothy G. Malone, Col, USAF and Reagan E. Schaupp, Maj, USAF. "The 'Red Team' Forging a Well-Conceived Contingency Plan" *Aerospace Power Journal*, Summer 2002, <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj02/sum02/malone.html> (Accessed 17 March 2010).
- ²² Fontenot, 24.

²³ Ibid, 26.

²⁴ Col. Allen Batshelet; Maj. Barry Hafer; Maj. Mike Runey, "Risking Critique, Red Teaming makes open criticism normal in military culture." *Armed Forces Journal*, November 2007, <http://www.armedforcesjournal.com/2007/11/3072814> (Accessed, 17 March 2010) This article highlights the growing acceptance of the internal critical analysis afforded by structured red teaming activities within the U.S. Army. The authors suggest a shift in mindset that encourages "critical review through the lens of alternative perspectives of . . . key products and decisions." (p. 49).

²⁵ Fontenot, 26.

²⁶ Ibid.

²⁷ Sandia National Laboratories, "The Information Design Assurance Red Team (IDART™), <http://idart.sandia.gov/index.html> (Accessed 28 March 2010).

²⁸ Matthew Lauder, "Red Dawn: The Emergence of a Red Teaming Capability in the Canadian Forces," *Canadian Army Journal*, Vol 12, no. 2. (Summer 2009): 34.

²⁹ Batchlett, Hafer, Runey, "Risking Critique."

³⁰ Jeffrey M. Reilly. *Operational Design, Shaping Decision Analysis through Cognitive Vision* Second edition. Air Command and Staff College, November 2009, 56.

³¹ Ibid, Fig. 4, 10.

³² Dr. Ronald A. Howard. "Speaking of Decisions: Precise Decision Language" *Decision Analysis* 1, no. 2 (June 2004): 71-78.

³³ Joint Doctrine Publication (JDP) 5-00 *Campaign Planning* (Second Edition), (The Development, Concepts and Doctrine Centre, Ministry of Defence, Shrivenham, December 2008), Annex 2-H "Military Risk."

³⁴ Ibid, 2H-1.

³⁵ Dr. Donald P. Wright and Colonel Timothy R. Reese with the Contemporary Operations Study Team, ON POINT II: Transition to the New Campaign: The United States Army in Operation IRAQI FREEDOM May 2003–January 2005, Fort Leavenworth, KS: Combat Studies Institute, 2008, pg 79

³⁶ JP 5-0, GL-10.

³⁷ Reilly, 66.

³⁸ Reilly, Table 4, 65.

³⁹ Gen Charles C. Krulak. "The Strategic Corporal: Leadership in the Three Block War" *Marines Magazine*, January 1999. http://www.au.af.mil/au/awc/awcgate/usmc/strategic_corporal.htm (Accessed, 31 March 2010).

⁴⁰ JP 5-0, GL-10. JP 5-0 defines decisive point as "A geographic place, specific key event, critical factor, or function that, when acted upon, allows commanders to gain a marked advantage over an adversary or contribute materially to achieving success." (GL-10)

⁴¹ JP 5-0 (III-26) defines a valid assumption as one that is logical, realistic, and essential for planning to continue.

⁴² JP 2-0 *Joint Intelligence* discusses the "paradox of warning," as follows: "A simple example of the "process of interaction" is the situation in which an intelligence officer, having detected certain adversary actions and correctly determined the adversary's intention, forecasts that the adversary is preparing to attack. The commander reacts by having friendly forces take appropriate defensive measures. The adversary commander, however, detecting these actions and deciding that attacking is no longer a desirable COA, cancels the attack. In this example, adversary actions produced a friendly reaction resulting in changes to the adversary's intention. This situation is known as the "paradox of warning" and is depicted in Figure I-9."

⁴³ *Red Team Handbook, Version 5* (University of Foreign Military and Cultural Studies, 7 November 2009) Fort Leavenworth, Kansas: U.S. Army Training and Doctrine Command, 60.

⁴⁴ Reilly, Figure 20, Integration of Commander Driven Operational Design with the Joint Operation Planning Process, 45.

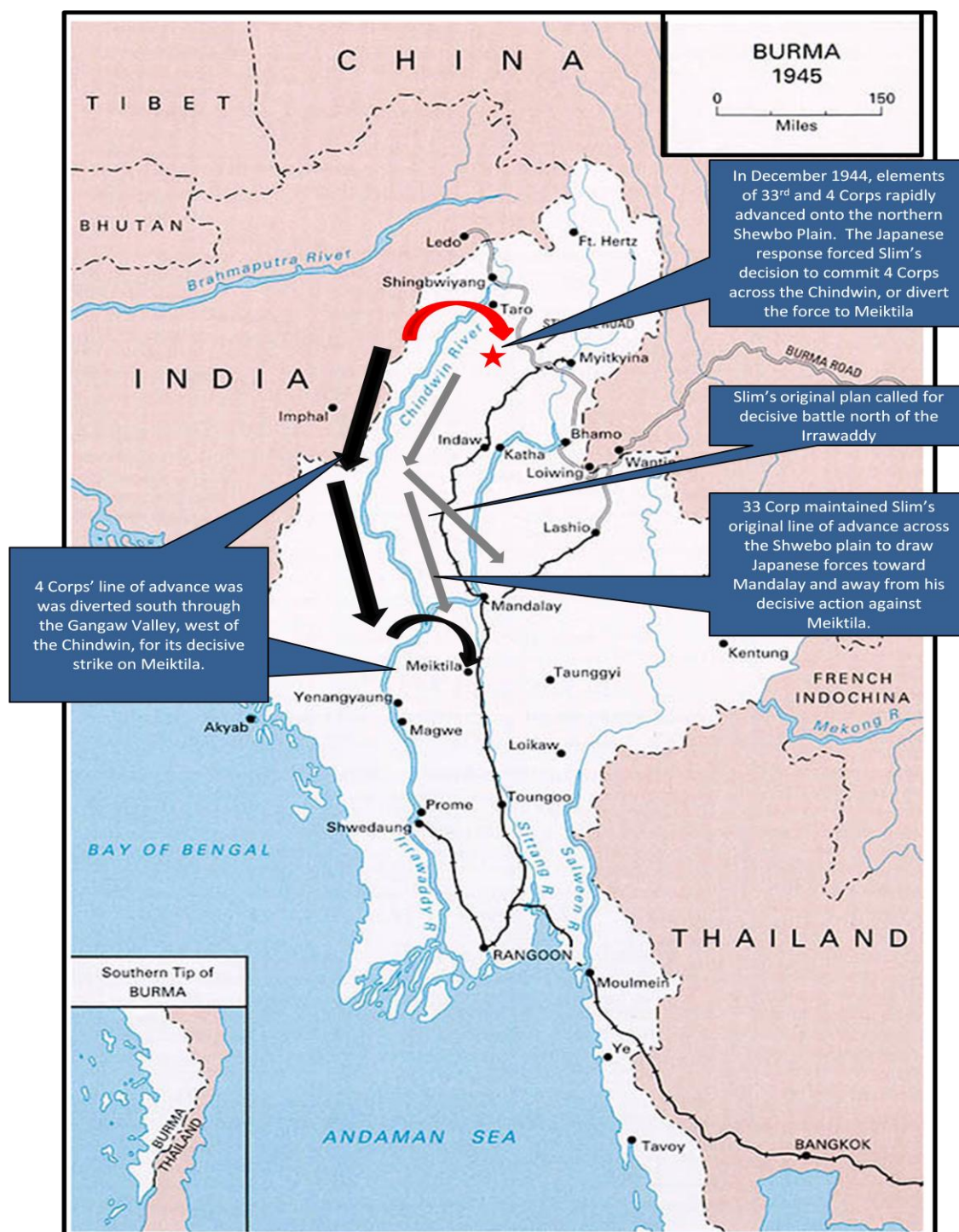
⁴⁵ Reilly, 44.

⁴⁶ *Red Team Handbook, Version 5*, 62-63.

⁴⁷ *Red Team Handbook, Version 5*, 61.

⁴⁸ TRADOC Pamphlet 525-5-500 *The United States Army Commander's Appreciation and Campaign Design, Version 1.0* (Fort Monroe, Virginia: Department of the Army, Headquarters Training and Doctrine Command, 28 January 2008), 9. This pamphlet refers to a 1972 description of socially complex problems by UC Berkeley professor of design, Horst Rittel, who identified wicked problems those that were not "wicked in the sense of evil, but rather extremely difficult." (p. 9)

⁴⁹ Rupert Smith, *The Utility of Force: The Art of War in the Modern World* (London: Penguin Books Ltd, 2005), 17-18, in TRADOC Pamphlet 525-5-500, 4.



APPENDIX A: Burma Area Campaign Map.

Field Marshal Slim's original campaign plan involved a decisive battle on the Shewbo Plain north of the Irrawaddy River. However, the Japanese reaction to his advance in early December 1944 created a decision point (indicated by the star) in which Slim had to decide whether to commit 4 Corps to an advance across the Shwebo Plain or divide his forces and attempt a decisive strike against the Japanese rear at Meiktila.

Base map is courtesy of the U.S. Army Center of Military History and was originally printed in *Central Burma, The U.S. Army Campaigns of World War II*. Accessed at: <http://www.history.army.mil/brochures/centburma/centburma.htm> (17 April 2010).

Bibliography

- Allen, Louis *Burma, The Longest War 1941-45*. New York: St. Martin's Press, 1984.
- Batshelet, Col. Allen; Hafer, Maj. Barry; Runey, Maj. Mike, "Risking Critique, Red Teaming makes open criticism normal in military culture," *Armed Forces Journal*, November 2007
- Fontenot, Colonel Gregory, USA (ret); Colonel Darrell L. Combs, USMC (ret), "Fighting Blue: Why First Class Threat Emulation is Critical to Joint Experimentation and Combat Development," *American Intelligence Journal* 26, no. 2 (Summer 2008).
- Gold, Ted and Bob Herman. *Defense Science Board Task Force on The Role and Status of DOD Red Teaming Activities*. Defense Science Board Task Force. Washington, DC: Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics. 2003.
- Howard, Dr. Ronald A. "Speaking of Decisions: Precise Decision Language" *Decision Analysis* 1, no. 2, June 2004.
- John, Miriam and Robert Stein, *Report of the Defense Science Board Task Force on Capability Surprise Volume I: Main Report*, Office of the Undersecretary of Defense for Acquisition, Technology, and Logistics. Washington DC: September 2009.
- Joint Doctrine Publication (JDP) 5-00 *Campaign Planning* (Second Edition), The Development, Concepts and Doctrine Centre, Ministry of Defence, Shrivenham, United Kingdom, December 2008.
- Kirkpatrick, Shelley "Staying One Step Ahead: Advancing Red Teaming Methodologies through Innovation," Arlington, VA: Homeland Security Institute, 8 February 2005.
- Krulak, Gen Charles C. "The Strategic Corporal: Leadership in the Three Block War" *Marines Magazine*, January 1999. http://www.au.af.mil/au/awc/awcgate/usmc/strategic_corporal.htm (Accessed, 31 March 2010).
- Lauder, Matthew, "Red Dawn: The Emergence of a Red Teaming Capability in the Canadian Forces," *Canadian Army Journal*, Vol 12, no. 2. (Summer 2009).
- Longbine, David F. "Red Teaming: Past and Present." School of Advanced Military Studies Monograph, U.S. Army Command and General Staff College, 2008.
- Malone, Timothy G., Col, USAF and Reagan E. Schaupp, Maj, USAF. "The 'Red Team' Forging a Well-Conceived Contingency Plan" *Aerospace Power Journal*, Summer 2002.
- Reilly, Jeffrey M. *Operational Design, Shaping Decision Analysis through Cognitive Vision* Second edition. Air Command and Staff College, November 2009.
- Sandia National Laboratories, "The Information Design Assurance Red Team (IDARTTM), <http://idart.sandia.gov/index.html> (Accessed 28 March 2010).
- Slim, William J.S. *Defeat into Victory: Battling Japan in Burma and India, 1942-1945*. New York: Cooper Square Press, 2000.
- TRADOC Pamphlet 525-5-500 *The United States Army Commander's Appreciation and Campaign Design, Version 1.0* Fort Monroe, Virginia: Department of the Army, Headquarters Training and Doctrine Command, 28 January 2008.
- University of Foreign Military and Cultural Studies. *Red Team Handbook: Version 5*. Fort Leavenworth, Kansas: U.S. Army Training and Doctrine Command, 2009.

U.S. Department of Defense. *Joint Publication 2-0, Joint Intelligence*, 22 June 2007.

U.S. Department of Defense. *Joint Publication 5-0, Joint Intelligence*, 26 December 2006

U.S. Department of Defense. *Quadrennial Defense Review Report, February 2010*. <http://www.defense.gov/QDR/> (Accessed, 17 March 2010).

Wright, Donald P. Dr, Colonel Timothy R. Reese with the Contemporary Operations Study Team, *ON POINT II: Transition to the New Campaign: The United States Army in Operation IRAQI FREEDOM May 2003–January 2005*, Fort Leavenworth, KS: Combat Studies Institute, 2008.